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ABSTRACT

Prepared by the State of Iowa Department of Public Instruction, this pamphlet is intended to be an aid for local curriculum committees who are developing and implementing the mathematics and science components of their school's multicultural, nonsexist education plan. Included are definitions of key terms, rationale and philosophy, legal authority, goals and objectives, a self-evaluation checklist, bibliography, and resource organizations for multicultural, nonsexist education. (DS)

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Multicultural Nonsexist Education

in Iowa Schools

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1981

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This pamphlet is intended to be an aid for local curriculum committees who are developing and implementing the mathematics and science components of their school's multi-cultural, nonsexist education plan.

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Definitions

1. **Multicultural Education:** the educational processes which promote the understanding and appreciation of the cultural diversity of our pluralistic society. Within the total multicultural educational process, special emphasis shall be placed on the following groups: Asian American, Black American, Hispanic American, and Native American and on the handicapped. The educational program shall be characterized by practices which provide equal opportunity for all participants regardless of race, color, age, national origin, religion or handicap.

2. **Nonsexist Education:** the educational processes which foster the knowledge of, and respect and appreciation for the historical and contemporary contributions of men and women to society, as well as those educational processes that reflect the wide variety of roles open to both men and women. The educational program shall be characterized by practices which provide equal opportunity to both sexes.

3. **Curriculum structure:** those administrative processes and decisions which have an impact on the mathematics and science program.

4. **Curriculum content:** the concepts, processes, facts and values that are taught in the mathematics and science program.

5. **Instructional materials:** the physical artifacts which are utilized during the teaching process in the mathematics and science programs.

6. **Teaching strategies:** the methods and approaches the teacher utilizes in science and mathematics programs.

7. **Ethnocentric:** from the point of view of one's own ethnic group.

8. **Male-centric:** from the male point of view.

9. **Euro-centric:** from the European or Euro-American point of view.

10. **Multi-centric:** from several points of view.

11. **Science:** the study of the natural physical world of which we are a part. It is both an *investigatory process* and a *body of knowledge*, readily subjected to investigation and verification.

12. **Mathematics:** the study of quantities, magnitudes and forms, and their relationship to one another by the use of numbers and symbols.

Rationale & Philosophy

It is very important that all students see themselves reflected in their curriculum, regardless of their sex, race, cultural background or disability. Students who do not see themselves reflected in the curriculum of their classrooms in positive ways often feel alienated from the educational process and soon are led to question their own worth.

It is equally important that students see the contributions and perspectives of the disabled, other races and other cultural groups, as well as the other sex reflected in the school curriculum. The students who are not exposed to other groups through the curriculum often develop an inflated sense of self or group superiority ("the we did it all syndrome"). This feeling can often lead to patronizing attitudes among individuals of one group toward those in another, or of one sex toward the other. Therefore, the school curriculum plays an important role in the development and practice of healthy intergroup and interpersonal attitudes and relations.

The traditional school curriculum has been heavily influenced by the melting pot theory. This theory states that the many ethnic groups in the United States should be molded into a common group called "Americans" who have similar customs, values, and language patterns. Cultural diversity was depicted as being a source of division and conflict rather than a source of past, present, and future richness, creativity and strength. This pressure toward conformity led to the suppression of many native and immigrant cultural patterns and to the exclusion of the contributions and perspectives of women, minority groups, the disabled and immigrants from southern and eastern Europe from the school curriculum. The result was a curriculum in which many citizens did not see themselves or other groups reflected.

The multicultural, nonsexist curriculum is based on the theory of cultural pluralism. This theory celebrates the diversity that characterizes a nation in which three hundred Indian tribes were joined by numerous men and women from every continent and every country on this planet. It represents cultural and sex role diversity as strengths which enrich the United States. The multicultural, nonsexist curriculum is one in which all citizens can see themselves and other groups reflected.

The above concepts apply to all areas of the school curriculum, but they have a unique implication for the science and mathematics programs. In a highly technical society such as exists in the United States, the development of basic mathematical and scientific skills is one key to unlocking the doors to many stimulating and rewarding careers. The engineer, the doctor, the computer programmer, the physicist, the chemist, the veterinarian, the computer technician, the electrician, the carpenter, the salesperson and the businessperson all must exhibit proficiency in basic scientific and/or numerical skills. The value our society places on these skills is reflected by the economic and social status these professionals have in our society.

It is therefore critical that all ethnic groups, men and women, and the disabled see themselves reflected in the mathematics and science curricula. It is essential that all students recognize the degree to which development of sound basic mathematical and scientific skills can expand and broaden their economic and career horizons. All students must see potential for themselves in their academic study. If they do not, their motivation and achievement will progressively lessen.

The stereotype of science and math careers as white, male domains is historically a strong one in this country. If the effects of this stereotype are to be diminished, it is important for Euro-Americans and males to see other racial groups, ethnic groups, women and the disabled reflected in their

curricula so they will come to accept them in these non-traditional roles. We must remember that we are not only educating the future doctors, dentists, engineers and electricians of this country, but also the consumers of the services these professions provide. If a student leaves our schools with a strong stereotype of the white, male physician, it is very likely she/he will search out a physician who meets that stereotype. There will not be equal access to success in the field of medicine until males feel comfortable going to female physicians.

Ultimately there is evidence to show that the mathematical and scientific professions will not equitably serve diverse racial/cultural groups or both men and women until the ranks of the professionals themselves better reflect the makeup of the society they hope to serve. Our schools can play a large role in helping us to reach this goal.

The Legal Authority

Iowa Code (Sec. 257.25, Paragraph 1)

The State Board shall promulgate rules to require that a multicultural, nonsexist approach is used by school districts. The educational program shall be taught from a multicultural, nonsexist approach.

Iowa School Standards 670--3.5 (257)

3.5(3) Classroom Instruction in each area of instruction shall be from a multicultural, nonsexist approach in each school district, kindergarten through grade twelve.

3.5(5) BOARD OF DIRECTORS RESPONSIBILITY FOR ASSURING MULTICULTURAL, NONSEXIST APPROACHES TO EDUCATIONAL PROGRAMS. Each board shall develop a written plan of action within one year of the effective date of this rule.* The plan shall include a specific timeline for implementation, not to exceed five (5) years, for achieving and maintaining a multicultural, nonsexist educational program. A copy of the plan shall be filed locally in a readily available form and location, as evidence of compliance with the provision of the law.

3.5(5)c The multicultural, nonsexist educational plan shall include:

(1) Specific goals and objectives with implementation timelines for each component of the educational program;
(2) A description of the inservice activities planned for all staff members on multicultural, nonsexist education;
(3) Evidence of systematic input by men and women, minority groups, and the handicapped in the development and implementation of the plan, and that in schools where no minority students are enrolled, minority group resource persons shall be utilized at least annually;
(4) A description of the periodic, ongoing system to monitor and evaluate the plan.

* *Effective date of rule: July 16, 1979.*

3.5(6) Instructional program for each subject. Classroom instruction in each subject taught in the schools shall be based on careful planning. The board shall require that a resource guide be developed for each instructional sequence reflecting multicultural, nonsexist approaches, and it shall include a statement of its educational purposes; suggested instructional activities, materials and content; and a description of the performance criteria used in evaluating each pupil's progress during the educational sequence.

The curriculum structure, content, instructional materials, and teaching strategies shall reflect the contributions and perspectives of women and men and diverse racial/ethnic groups. Where sex and/or cultural-racial stereo-typing exists in instructional materials, it shall be brought to the attention of the students and supplementary materials shall be used to offset the stereo-typing. Multicultural, nonsexist instructional materials shall be adopted at the first opportunity to do so. The curriculum shall include activities which promote an awareness of sexism and cultural, racial bias in the English language.

Goals & Objectives

Multicultural, nonsexist education concepts should be a visible, integral part of the mathematics and science programs. They should be visible in the goals and objectives, the curriculum guides, and the daily lesson plans. The following four goals are suggested as a model for the multicultural, nonsexist education program. Each goal is accompanied by a set of objectives specifically pertaining to mathematics and science. Activities related to each of the objectives should be integrated into each grade level of mathematics and science programs.

Goal 1:

To help students develop positive and realistic self-concepts regardless of race, sex, cultural background or disability. This self-concept should be based upon an understanding and valuing of their own personal and group identities, as well as a greater awareness of their values and the relationship of those values to their everyday decisions and actions.

Objective a: The students will explore their own personal and group experiences in relationship to the fields of mathematics and science. All students, regardless of sex, race, national origin or disability, will see themselves reflected in the science and mathematics classroom environment.

Objective b: Students will be exposed to language patterns in the classroom through which they see broad potentials for themselves in the fields of mathematics and science regardless of their sex, race, culture or disability.

Goal 2:

To help students understand that both sexes, diverse racial/cultural groups and the disabled have made valuable contributions to the heritage of the United States and that this rich diversity enriches and strengthens our country. Inherent in this goal is the exposure of students to a broad range of career roles and lifestyles regardless of their sex, race, cultural heritage or disability.

Objective a: The students will demonstrate an awareness of the valuable and unique contributions that diverse racial/cultural groups, both men and women, and the disabled have made to the fields related to science and mathematics in Iowa, the United States, and the world.

Objective b: The students will explore a broad range of career roles in fields which require basic mathematical and scientific skills regardless of their sex, race, culture or disability.

Objective c: Students will acquire an understanding of how the involvement and perspectives of diverse racial/cultura groups and both women and men within professional groups related to science and mathematics will help insure that these professions provide necessary service to all individuals and groups regardless of race, sex, culture, disability or socio-economic background.

Goal 3:

To help students understand that all persons have common needs, feelings, and problems, while at the same time stimulating their respect for the uniqueness of each individual and cultural group. Inherent in this goal is the awareness that racism, sexism, cultural bias, and bias toward the disabled are social phenomena.

Objective a: Students will demonstrate an understanding of the scientific basis for the physical difference of the major racial groups of the human family as well as those characteristics which are common to all human beings.

Objective b: Students will demonstrate an awareness of the common characteristics of men and women as well as of the physical sex differences which make each sex unique. These real sex differences should be taught in a manner which does not exaggerate them or reinforce traditional sex role stereotypes.

Objective c: Students will recognize when real sex differences, racial/cultural differences or effects of disability are exaggerated in order to promote racist and sexist philosophies or discrimination against disabled citizens.

Goal 4:

To help students develop positive interpersonal and intergroup communication techniques, as well as a motivation to play an active role in the solution of societal conflicts. Inherent in this goal is the understanding that present societal conflicts are a condition of centuries of cultural and group conditioning, and that improved human relations depends upon increased intergroup and interpersonal communication, understanding, and cooperation.

Objective a: Students will be aware of the relationship between scientific development and social patterns in Iowa, the United States and the world. Ethical utilization and application of scientific developments will be explored.

Objective b: Students will demonstrate the ability to anticipate the impact of scientific decision on both men and women as well as diverse cultural groups.

Objective c: Students will be motivated to become actively involved in applying mathematical and scientific concepts to the resolution of contemporary and future social problems.

A Self-Evaluation Checklist

School districts in Iowa are currently being asked to review their curriculum programs to determine the degree to which they are consistent with the basic concepts of multicultural, nonsexist education. This checklist is intended to be a general guide to use when looking at the science and mathematics curriculum, K-12.

The answers to some of the questions in Section A may be rather obvious in some school districts. They are asked because the makeup of the instructional staff and the classroom student population have major implications for the strategies used in the multicultural, nonsexist education program. Districts which have stereotypical staffing patterns (examples: male administrators, all female elementary instructors, all white staffs, all male science instructors, etc.) should build objectives for change into their employment policies. Scheduling traditions or policies which may reinforce or cause sex-typed class enrollments (80% or more of one sex) or minority isolation should be changed.

A. Curriculum Structure

1. Are there diverse role models (male-female, diverse cultures/races) teaching mathematics and science at both the elementary and secondary levels? ____Yes____No
   a. If the answer to question #1 is no, what caused this to happen? Are there long-range strategies for changing this pattern?
   b. What impact does this have on the strategies that will be used to achieve multicultural, nonsexist science and mathematics objectives?

2. Are there disabled employees on the school district staff who may serve as role models for students? ____Yes____No

3. Are there diverse student enrollments (male-female balance and ethnic and racial diversity similar to that found in the district) in all elementary and secondary mathematics and science units? ____Yes____No
   a. If the answer to question #3 is no, what caused this to happen? Are there long-range strategies for changing this pattern? ____Yes____No
   b. What impact does this have on the strategies that will be used to achieve multicultural, nonsexist science and mathematics objectives? ____Yes____No

4. Are scheduling practices used which may result in sex-typed enrollments (80% or more of one sex) or the relative isolation of racial/cultural groups and the disabled? ____Yes____No

5. Are mathemtics and science units or courses given titles which are more meaningful to one sex or cultural group? Are course descriptions free of bias or stereotyping? ____Yes____No

6. Has there been meaningful interaction between the science and mathemtics teachers and the personnel within the district who are responsible for the implementation of multicultural, nonsexist education? ____Yes____No

7. Has inservice on multicultural, nonsexist approaches to mathematics and science curriculum been provided for all elementary and secondary math-science teachers? ____Yes____No

8. Have the district administrators incorporated multicultural, nonsexist education concepts into the staff evaluation procedure? ____Yes____No

B. Curriculum Content

1. Do the mathematics and science curricula include units/activities which explore the importance of basic numerical and scientific skills in broadening career options and enhancing future earning capacity? ____Yes____No

2. Do the science and mathematics curricula include units/activities which explore related careers in nonstereotypic ways? ____Yes____No

3. Do the mathematics and science curricula include units/activities which cause students to become aware of their attitudes toward mathematics and science and which may lessen the math and science anxiety that many students, especially female and minority students might be experiencing? ____Yes____No

4. Do the science and mathematics curricula include content on the contribution of diverse racial/cultural groups, both women and men, and the disabled to the fields of science and mathematics? ____Yes____No

5. Does the science curriculum include content which stresses the potential, affective and social impact (both positive and negative) of decisions related to the utilization of new scientific concepts and process? ____Yes____No

6. Do Life Science and Biology curricula include content which provides students with a basic awareness of the concept of race which includes:
   - the common characteristics of all human beings? ____Yes____No
   - the unique physical characteristics of each major racial group? ____Yes____No
   - the genetic factors in race determination? ____Yes____No
   - the role science can potentially play in promoting racism or promoting racial equality and respect? ____Yes____No

7. Do Life Science and Biology curriculum include content which provides students with a basic awareness of:
   - the physical characteristics men and women have in common? ___Yes___No
   - the unique physical characteristics of men and women? ___Yes___No
   - the genetic factors involved in sex determination? ___Yes___No
   - the role science can play in promoting sexual equality and how it may also be misused as a basis for promoting sexism? ___Yes___No

C. Instructional Materials

1. Are illustrations in science and mathematics textbooks, supplementary materials, audiovisual aids, and on bulletin boards representative of the cultural/racial diversity in the United States as well as the roles open to both men and women in today's society? Are disabled persons represented? ___Yes___No

2. Are both women and men, diverse cultural/racial groups and the disabled shown in both active and passive roles? ___Yes___No

   Traditional and nontraditional roles? ___Yes___No

3. Are instructional materials free of ethnocentric or sexist language patterns which may make implications about persons or groups solely based upon their culture, race, sex, or disability? ___Yes___No

4. Are the content areas, mentioned in Section B, included in mathematics and science texts? ___Yes___No

5. Do the materials tend to reinforce stereotypes about cultural/racial groups, men and women or the disabled? ___Yes___No

6. Do science and math story problems represent women and men, diverse racial/cultural groups and the disabled in both:
   - active and passive roles? ___Yes___No
   - traditional and nontraditional roles? ___Yes___No
   - domestic and nondomestic roles? ___Yes___No

7. Do examples and word problems use both Anglo origin names such as Mary Jones, Bob Smith and James Baker as well as names of non-Anglo origin such as Juanita Ramos, Mitsue Yashima or Jonathan Youngbear? ___Yes___No

8. Have multicultural, nonsexist criteria been integrated into the science and mathematics textbook/instructional materials selection process at a district level? ___Yes___No

D. Teaching Strategies

1. Do classroom teachers avoid using oral language patterns which may be sexist or ethnocentric? ____Yes____No

2. Are classroom management strategies and role assignments used which reinforce multicultural, nonsexist student behavior? ____Yes____No

3. Are students alerted to stereotyping when it occurs in instructional materials? ____Yes____No

4. Are persons of diverse cultural/racial groups, men and women in both traditional and non-traditional roles and disabled individuals used as resource persons in the classroom? ____Yes____No

5. Is there a balance between large group, small group and individual activities in the classroom schedule so that all students regardless of sex, race/culture, and disability are encouraged to become integrally involved? ____Yes____No

6. Are the bulletin boards and teacher-made displays in the classroom representative of the cultural/racial diversity in the United States and roles open to both men and women? ____Yes____No

7. Have classroom teachers alerted the counseling staff to possible multicultural, nonsexist guidance techniques which are relevant to course work and career preparation in mathematics and sciences? ____Yes____No

Bibliography of Resource Materials

The following materials are valuable resources for mathematics and science teachers who are striving to implement multicultural, nonsexist education concepts. They are primarily teacher resources, but some include lists of materials or activities that can be used in the elementary and secondary classroom. It is meant to be a selective list rather than a comprehensive one. It should provide a nucleus for a resource center that will grow in the future.

Armstrong, Jane M. *Achievement and Participation of Women in Mathematics: An Overview.* Education Commission of the States, 1860 Lincoln Street, Suite 700, Denver, Colorado 80295. (303/830-3600). (C) 1980. Price N/A.
A summary of the results of a study by the National Institute of Education on the participation and achievement of girls in mathematics. At the conclusion of the report, strategies are suggested which may increase female participation in mathematics programs. This publication is out of print but available through ERIC. The number is ED187562.

Blum, Lenore. *Count Me In: Educating Women for Science and Math.* Women's Educational Equity Act Publishing Center, 55 Chapel Street, Newton, Masachusetts 92160. (617/969-7100). (C) 1978. Price $36.00 (6.00 rental).
This informative thirty-minute videotape is used as a springboard for classroom or workshop discussions about nontraditional career opportunities for women. Through a series of taped vignettes, women of different ages, ethnic backgrounds, mathematical preparation, and career aspirations demonstrate that women can excel in mathematics and science and enter nontraditional fields.

Brown, Janet W. *Native American Contributions in Science, Engineering, and Medicine.* Science Magazine, Volume 189, July 4, 1975, pp 38-40.
This article is one of the few resources available for raising teacher awareness of Indian contributions and perspevtives toward the sciences.

Blum, Lenore. *Expanding Your Horizons in Science and Mathematics.* Women's Educational Equity Act Publishing Center, 55 Chapel Street, Newton, Massachusetts 02160. (617/969-7100). (C) 1980. Price (See below.)
Two films and a booklet help educators and parents encourage young women to consider careers in science and technology.
Expanding Your Horizons in Science and Mathematics: A Handbook for Conference Planners describes how to plan, conduct and evaluate conferences to increase a young woman's interest in mathematics and science.
"The Math-Science Connection: Educating Young Women for Today," a film for educators, parents and community leaders, presents four exemplary programs for girls and women who are considering scientific or technical study.
"Sandra, Zella, Dee, and Claire: Four Women in Science," a film for students in grades 7-12, explores the work and lives of an astronomer, a mechanical engineer, a veterinarian and a laser physicist.
40006 *Expanding Your Horizons: A Handbook for Conference Planners*
(50 pp.) $2.50
The Math-Science Connection: Educating Young Women for Today
16mm film (color, 18 minutes)

40007 Purchase $115.00
40008 Rental (3 days) $8.00
Videotape cassette (color, 3/4 inch, 18 minutes)
40009 Purchase $32.00
40010 Rental (3 days) $5.00
Sandra, Zella, Dee, and Claire: Four Women in Science
16mm film (color, 19 minutes)
40011 Purchase $120.00
40012 Rental (3 days) $8.00
Videotape cassette (color, 3/4 inch, 19 minutes)
40013 Purchase $32.00
40014 Rental (3 days) $5.00

Breyman, Ferol. *Beating the Numbers: A Math Careers Program Handbook.* Women's Educational Equity Act Publishing Center, 55 Chapel Street, Newton, Massachusetts 02160. (617/969-7100). (C) 1980. Price $8.00.
This manual describes how to conduct a basic mathematics and counseling program to help undereducated and underemployed women develop basic math skills to increase their job opportunities. The book is a valuable resource for continuing education instructors, career education specialists, counselors and underemployed women.

The Colors of Man Kit. Afro-American Publishing Company, Inc., 910 South Michigan, Suite 556, Chicago, Illinois 60605. (312/922-1147). This learning kit for K-3 primary children starts with the creation of positive self-images in children of various skin colors and expands to the broader concepts of race and the unity of the human family.

Equality in Science: Formula for Changing Sex Bias. Women's Educational Equity Act Publishing Center, 55 Chapel Street, Newton, Massachusetts 02160. (617-969-7100). (C) 1979. Price $4.50.
The effects of stereotyping on student interest and ability in science are addressed in this inservice module. The contributions of women to science are discussed, along with ideas for activities in science classes and in the community.

Guidelines for Selecting Bias-Free Textbooks and Story Books. Council on Interracial Books for Children, 1841 Broadway, New York, New York 19923. (212/757-5339). (C) 1979. Price $6.95.
This resource provides a guide for selecting instructional materials. It contains components in all the major curriculum areas including science and mathematics.

Haber, Louis. *Black Pioneers of Science and Invention.* Harcourt Brace Johanovich, 757 Third Avé., New York, New York. (212/888-4444). (C) 1973. Price $6.75.
A good resource for teachers who want to integrate information on minority scientists and mathematicians into their curriculum.

Hardeman, Carole. *MATHCO: Interdiciplinary Uses of Math in Career Choices: A Curriculum Model.* Women's Educational Equity Act Dissemination office, 55 Chapel Street, Newton, Massachusetts 02160. (617/969-7100). (C) 1981. Price (Still to be determined.)
*Will be available after October, 1981.
A packet of materials for breaking down stereotypes related to math related careers. The materials are designed for interdisciplinary use in various curriculum areas.

Hayden, Robert C. *Eight Black American Inventors.* Addison Wesley Publishing Co., Jacob Way, Reading, Massachusetts 01867. (617/944-3700). (C) 1976. Price $6.95.
A collection of biographies of Black Americans who have contributed original inventions. It is best suited for junior and senior high school students.

Hayden, Robert C. and Harris, Jacqueline. *Nine Black American Doctors.* Addison

Wesley Publishing Co., Jacob Way, Reading, Massachusetts 01867. (617/944-3700). (C) 1976. Price $6.95.
This publication includes biographies of Black Americans who have contributed to the field of medicine. It is written for grades 6 - 12 and is an excellent resource for the teacher who wants to integrate the contributions and perspectives of Black Americans into the science curriculum.

Hayden, Robert C. *Seven Black American Scientists.* Addison Wesley Publishing Co., Jacob Way, Reading, Massachusetts 01867. (617/944-3700). (C) 1970. Price $6.95.
A collection of biographies of Black American scientists. It is best suited for junior and senior high school students.

Jacobs, Judith E. *Perspectives on Women and Mathematics.* ERIC Clearinghouse for Science, Mathematics and Environmental Education, College of Education, Ohio State University, 1200 Chambers Road, Third Floor, Columbus, Ohio 43212. (C) 1978.
A monograph made up of papers presented at the 1978 conference of the National Council of Teachers of Mathematics. One of the program strands of that conference was Women in Mathematics. The research, ideas, and recommendations of several nationally prominent educators are included.

Jue, David F. *Chinese Kites, How To Make And Fly Them.* C. Tuttle Co. Available from Japanese American Curriculum Project, 414 East 3rd Ave., P.O. Box 367, San Mateo, California. (415/343-9408).
This book includes the history and tradition of Chinese kite making. It also includes kite activities, step by step, "how to" directions of many different designs.

Krammer, Ann E. *Science, Sex and Society.* Women's Educational Equity Act Publishing Center. 55 Chapel Street, Newton, Massachusetts 02160. (617/969-7100). (C) 1979. Price $15.75.
This extensive collection of readings examines the interrelationships among science, society, and the lives of women scientists. This book includes resources for developing an introductory college course to encourage women to explore career opportunities in science.

Kasburg, Alice; Kreinberg, Nancy and Downie, Diane. *Use Equals To Promote the Participation of Women in Mathematics.* Equals Project, Laurence Hall of Science, University of California, Berkeley, California 94720. (415/642-1823). (C) 1980. Price $5.00.
A handbook for sex-fair mathematics and career counseling methods. Includes materials for both the elementary and secondary educators.

Kogelman, Stanley and Warren, Joseph. *Mind Over Math.* The Dial Press, 1 Dag Hammarskjold Plaza, New York, New York 10017. (212/832-7300). (C) 1978. Price $3.95.
This book was written by two prominent mathematicians based on their experiences in leading groups to help people overcome math anxiety. It provides some interesting insights and strategies for teachers who may notice the symptoms of this ailment in themselves or their students.

Kojima, Takashie. *The Japanese Abacus, Its Use and Theory.* C. Tuttle Co., Japanese American Curriculum project, 414 East Ave., P.O. Box 367, San Mateo, California. (415/343-9408). (C) 1954. Price $3.25.
This book includes the theory behind the abacus as well as instructions for its use. It also includes problems and exercises.

Kreinberg, Nancy. *I'm Madly In Love With Electricity and Other Comments About their Work*. Equals Project, Laurence Hall of Science, University of California, Berkeley, California 94720. (415/642-1823). (C) 1977. Price $2.00
A career booklet for students in which 70 women discuss aspects of their jobs in science.

Menard, Sharon. *How High the Sky? How Far the Moon?* Women's Educational Equity Act Publishing Center, Educational Development Center, 55 Chapel Street, Newton, Massachusetts 02160. (617/969-7100). (C) 1978. Price $14.50.
This K-12 curriculum resource guide provides a wealth of activities designed to expand students' interest in scientific and technical careers. Outstanding accomplishments of women in science are high-lighted in seven short biographies and supplemented by taped interviews. Extensive information about science careers, and an annotated list of print and audiovisual material for each grade level are provided. (Includes 4 tape cassettes).

Minority Contributors I. Minorities in Engineering Project, National Coordinating Center for Curriculum Development. State University of New York at Stony Brook. Available from Ginn Custom Publishing, 191 Spring Street, Lexington, Massachusetts. (617/861-1670). (C) 1980. Price $1.50.
This publication highlights the careers of minority mathematicians, scientists and engineers. It is a good resource for secondary students who may be considering such careers. Included are interviews with the individuals in which they share their perspectives toward their work.

Minority Contributors II. Minorities in Engineering Project, National Coordinating Center for Curriculum Development. State University of New York at Stony Brook. Available from Ginn Custom Publishing, 191 Spring Street, Lexington, Massachusetts. (617/861-1670). (C) 1980. Price $1.50.
This publication is similar to Minority Contributors I; however, its emphasis is on Hispanic, Indian, and Asian American scientists, mathematicians and engineers.

Mizmura, K. *If I Were A Cricket*. T.Y. Crowell Co. Available through the Japanese American Curriculum Project, 414 East Third Ave., P.O. Box 367, San Mateo, California 94401. (415/343-9408). (C) 1973. Price $7.95.
A primary science book with outstanding artwork which adds a multi-cultural flavor to science.

Osen, Lynn M. *Women in Mathematics*. The M.I.T. Press, Massachusetts Institute of Technology, 28 Carleton Street, Cambridge, Massachusetts 02142. (617/253-2884). (C) 1974. Price $4.95.
A historical review of the impact women have had on the development of mathematical thought. It explores the lives of women who have made significant contributions, and delves into the social context within which they worked.

Perl, Teri. *Math Equals: Bibliographies of Women Mathematicians and Related Activities*. Addison-Wesley Publishing Company, Jacob Way, Reading, Massachusetts 01867. (617/944-3700). (C) 1978. Price $8.95.
The book explores the lives of a number of women who have made significant contributions to mathematics. It also includes math activities in the context of the work in which they were involved.

Sex Stereotyping in Math Doesn't Add Up. Women's Educational Equity Act Publishing Center, 55 Chapel Street, Newton, Massachusetts 02160. (617/969-7100). (C) 1979. Price $4.50.
This learning module covers sex

differences in math ability, the ways in which stereotyping limits math skill development, how students' decisions about math affect future career choices, and how teachers can help students to develop their math skills. The module contains a 30-minute audiotape cassette, instruction sheet for leaders, handouts for participants, bibliography and transparency masters.

Streeter, Tal. *The Art of the Japanese Kite.* Weatherhill Publishing Co. Available through the Japanese American Curriculum Project. 414 East 3rd Ave., San Mateo, California. (415/343-9408). (C) 1974. Price $9.95.
The book includes the history and traditions of Japanese kite-making. It also includes a detailed "How To" section. It could be used for projects related to flight and aerodynamics.

The Great Black Inventors' Calendar. Miller Brewing Company, Great Black Inventors' Calendar, P.O. Box 7815, Westbury, New York 11592. Price $2.25.
This calendar features posters of famous Black Inventors. It would be very useful for adding a multicultural flavor to bulletin boards and the classroom environment.

Tobias, Shelia. *Overcoming Math Anxiety.* W.W. Norton & Co., 500 5th Ave., New York, New York. (212/354-5500). (C) 1978. Price $10.95.
An excellent resource for the classroom teacher who is interested in developing a strategy for working with students who come to the mathematics classroom with great apprehension.

Vecsey, Christopher and Venables, Robert W. *American Indian Environments: Ecological Issues in Native American History.* Syracuse University Press, 1011 East Walter St., Syracuse, New York. (315/423-2596). (C) 1980. Price $9.95.
A collection of writings on the historical and contemporary relations between Native Americans and their environment. It is a teacher resource for integrating cross-cultural concepts into Biology and Environmental Science programs.

Yep, Laurence. *Dragon Wings.* Harper Row Publishing Co. Available through Japanese American Curriculum Project, 414 East 3rd Ave., San Mateo, California. (415/343-9408). (C) 1977. Price $1.95.
An award winning novel based upon facts about a Chinese who made a flying machine during the Wright era.

Resource Organizations

The agencies or persons listed below are just a few of those which may provide assistance, ideas and information on resources to school districts that are striving to implement multicultural, nonsexist science and mathematics programs.

The Educational Equity Section of the Iowa Department of Public Instruction. Grimes State Office Building, Des Moines, Iowa 50319.
The Educational Equity Section is funded to provide assistance to Iowa educational agencies in the areas of race desegregation, sex desegregation, multicultural curriculum, nonsexist curriculum, affirmative action and human relations.

The Mathematics and Science Consultants. Instruction and Curriculum Division, Iowa Department of Public Instruction, Grimes State Office Building, Des Moines, Iowa 50319.
The mathematics and science consultants provide program assistance in all areas of the math and science curriculum including multicultural, nonsexist education.

The Midwest Sex and Race Desegregation Assistance Center. 1627 Anderson Avenue, Box 3000, Manhattan, Kansas 66506.
The Midwest Center is a federal agency which provides assistance to school districts in Iowa, Nebraska, Kansas and Missouri in the areas of sex and race desegregation; multicultural, nonsexist curriculum; and human relations.

The Dissemination Center for the Women's Educational Equity Act Program. c/o Educational Development Center. 55 Chapel Street, Newton, Massachusetts 02160. Toll free number: 800-255-3088.
The Women's Educational Equity Act (WEEA) was passed by Congress in 1974 to promote sex equity in education. Funds were made available for development of inservice training programs, curriculum evaluation instruments, sex-fair curriculum materials and women's studies units. The Center is responsible for disseminating the educational products of the WEEA program.

Iowa Area Education Agencies. Multicultural, Nonsexist Education Coordinators.
The area education agencies have begun to build a capacity for providing assistance to school districts as they work toward educational equity goals. Each agency has a consultant who has responsibility for multicultural, nonsexist education. You are encouraged to contact your local area education agency coordinator for assistance.

Racism and Sexism Resource Center for Educators. Council on Interracial Books for Children, CIBC Resource Center. Room 300, 1841 Broadway, New York, New York 10023.
The Resource Center publishes and distributes teaching materials to combat sex role and cultural stereotyping. A catalog of resource materials is available upon request.

The Midwest National Origin Desegregation Assistance Center. School of Education, University of Wisconsin-Milwaukee, 453 Enderis Hall, P.O. Box 413, Milwaukee, Wisconsin 53201.
This center is one of nine "Lau" centers in the United States funded by the U.S. Office of Education under Title IV of the Civil Rights Act of 1964. The Center assists school districts in providing whatever special services are necessary to insure that a student whose dominant language

is not English is not limited in participating in educational activities by a lack of English proficiency. The Center serves 10 mid-west states including Iowa.

Council for Exceptional Children. 1920 Association Drive, Reston, Virginia 22091. The Council is an excellent resource agency for educators who want to increase student awareness about disabled persons.

Math/Science Network. Math/Science Resource Center. Mills College, Oakland, California 94613.
The Network is an association of individuals and organizations established to promote the participation of women in mathematics and science and to encourage their entry into nontraditional occupations. A newsletter and other publications are available through the Network.

Minorities In Engineering Project. National Coordinating Center for Curriculum Development. College of Engineering and Applied Science. State University of New York at Stony Brook, Stony Brook, New York 11794.
This project has been established to encourage minority students to consider careers in math and science areas. They have developed career oriented materials aimed at secondary students.

Japanese American Curriculum Project. 414 East Third Ave., San Mateo, California 94401. (415/343-9408).
The JACP publishes curriculum materials by and about Asian Americans. It is an excellent resource organization for teachers who want to integrate content about Asian Americans into the curriculum.

Center For Educational Experimental Development and Evaluation. 218 Lindquist Center, University of Iowa, Iowa City, Iowa 52242. (319/353-4200).
The Center was funded to develop materials to assist in the education of Limited English Speaking Students. Mathematics and science materials are available in the Spanish, Laotian, Vietnamese, Cambodian and English languages.

Native American Science Resource Center. 305 Bartlett Hall, Dartmouth College, Hanover, New Hampshire 03755. (603/646-3607).
This resource center has gathered materials related to the science education of Native Americans as well as Native American contributions and perspectives to the area of science.